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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,045	01/14/2002	J. Barry Shackleford	10017560-1	3502

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EXAMINER
SIMS, JASON M

ART UNIT	PAPER NUMBER
1631	

DATE MAILED: 11/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/047,045	SHACKLEFORD, J. BARRY	
	Examiner	Art Unit	
	Jason M. Sims	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *12-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's arguments filed 10/7/2005 have been fully considered but they are not persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

It is noted that applicant has improperly labeled claims 12-23 with the wrong indicator. Claims 12-23, being drawn to non-elected subject matter, should indicate withdrawn as noted in the office action summary mailed out 6/29/2004. Appropriate correction is required.

Claims 1-11 are the current claims hereby under examination

Claim Rejections - 35 USC § 102-Reiterated

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Lipman et al. [Science 227:1435 (1985)].

Lipman et al. is directed to searching databases (containing parent sequences) for a newly determined sequence (target sequence) via microcomputers programmed with an algorithm for such searching as summarized in the abstract. It is noted that the instant claims are directed to a circuit arrangement which is reasonably deemed to be

inclusive of microcomputer hardware with its associated software program components. Lipman et al. discloses an original algorithm as one type of sequence searching algorithm on page 1435, third column, third full paragraph, through page 1436, second column, line 8, which performs a sequence search algorithm as a computer program. In this computerized algorithm the sequences to be compared for target searching are cited as sequences 1(target) and 2 (parent) sequences and stored (n contiguous codes as in instant claim 10) with character codes (instant claims 2 and 3) for the sequence of amino acids in each as required in instant claim 1, lines 3-6. These sequences are compared in said algorithm by shifting from amino acid pair to amino acid pair as also instantly required. A lookup table (instant claim 11 utilized a plurality of times for the sequence comparison; it is noted that claim 11 lacks any limitation as to whether the lookup tables are the same or different) is utilized to look up each amino acid pair and an offset value is determined for each amino acid in order through the two sequences being compared as also instantly claimed in the matching circuit in instant claim 1, lines 7-10. This value is then scored in a pipeline fashion [moving sum (or recent and next) (or prior, intervening, and first codes) as in instant claims 7, 8, or 9] along the sequences wherein the score is increased for an identity match and decreased for each mismatch as described on page 1436, bridging paragraph between the first and second columns. Thus identities vs. mismatch values are summed as required to produce values as in instant claim 1, lines 11-13. This therefore discloses a pipelined added arrangement is disclosed as instantly claimed in lines 11-13 of instant claim 1. The sequence comparisons are also organized in a dot-matrix homology plot as stated on

page 1436, first and second columns, lines 11-13, which inherently is reasonably also a pipelined adder tree, because the values for each of the alignments are sequentially made, as in a pipelined adder tree process where values are continually carried along until a final output, along the alignment process to result in a final similarity score (or binary vectors as in instant claim 6) and for the many diagonals therein represented which are separately determined and scored as instant claim 4. The summed score values are binary values due to being calculated within a microcomputer system programmed as set forth above. It is well known that the actual numerical values that are calculated in such a microcomputer/software arrangement are binary values due to this being the computation values utilized therein. Anderson et al. (P/N 3,969,724) is cited herein only to provide evidence of such binary value computational practice in microcomputers for now many years. Anderson et al. describes binary bit processing in columns 4-22 with binary machine code for control also described. In column 19, line 54, through column 20, line 25, registers are operated via bits arranged in Op codes. Bit manipulation is specifically cited in column 17, lines 20-24, as being performed during a variety of software program instructions including adding involving carry and propagate addition as required for addition operations as in instant claim 5. Thus, the above listed instant clams are anticipated by Lipman et al.

Response to Arguments

Response to Arguments For Claims 12-23

Applicant's arguments with respect to claims 12-23 are moot as said claims are drawn to non-elected subject matter and have been withdrawn as stated in the previous office action summary mailed out on 6/29/2004.

Claim Rejections - 35 USC § 102 –

Applicant's arguments filed 10/7/2005 have been fully considered but they are not persuasive.

Applicant argues that Lipman does not provide "a circuit arrangement for searching a parent code sequence for a target code sequence" from the preamble of claim 1 and that the preamble of claim 1 is directed to a particular circuit. Therefore, Lipman cannot anticipate the preamble of claim 1 because of this lack of a custom circuit.

This point is not persuasive because in the abstract, Lipman inherently provides a particular circuit arrangement by implementing a particular algorithm for searching a parent code sequence for a target code sequence. Lipman specifically states "An algorithm was developed" and the development of such is the development of a custom algorithm that fits the needs of the investigator, which is indicative of a custom circuit, "which facilitates the search for similarities between newly determined amino acid sequences and sequences already available in databases," which represents searching a parent code sequence for a target code sequence.

Applicant further argues that Lipman does not provide "a shift register arrangement having a plurality of stages, wherein each stage stores a code of a subset

of codes of the parent code sequence, and the shift register arrangement is adapted to periodically shift the subset of codes to form a new subset of codes with another code from the parent code sequence in a leading stage" and that Lipman does not specifiy using such shift registers in the manner described and provided for in Claim 1.

This point is not persuasive because the shift register as claimed, not being more specifically defined in the instant specification, is broadly defined, on page 4 of the instant specification, to general stages where each stage stores a new code of a subset of codes of a parent sequence. This very broad definition of the shift register component of the circuit arrangement reads on the Lipman comparison component of the cited algorithm where the sequences are compared in said algorithm by shifting from amino acid pair to amino acid pair, which the different amino acid pairs represent the forming of a new subset of codes with another code from the parent code sequence, and the shifting from amino acid pair to amino acid pair represents a shift register arrangement having a plurality of stages.

Applicant further alleges that Lipman does not provide "a matching circuit coupled to the shift register arrangement, the matching circuit adapted to ascertain code-position matches between the subset of codes in the stages of the shift register arrangement and codes in corresponding code positions of the target code sequence, and provide a programmed binary value for each code position match" as recited in claim 1, but instead provides an amino acid replacement matrix using software to improve performance.

This point is not persuasive because Lipman discloses an algorithm where the sequences are compared by shifting from amino acid pair to amino acid pair, which reads on "a matching circuit" and the algorithm is searching for matches, which reads on the "matching" aspect of this component of the circuit, and shifts from amino acid pair to amino acid pair while searching for matches, which represents a coupling between the shift register arrangement and the matching component of the circuit.

Applicant further argues that Lipman does not provide "a pipelined adder arrangement coupled to the matching circuit, the adder arrangement adapted to sum the binary values for code position matches for each respective subset of codes."

This point is not persuasive because the applicant only states that Lipman does not mention a pipeline operation, but Lipman does sequence comparisons that are organized in a dot-matrix homology plot as stated on page 1436, first and second columns, lines 11-13, which inherently is reasonably also a pipelined adder tree, because the values for each of the alignments are sequentially made, as in a pipelined adder tree process where values are continually carried along until a final output, along the alignment process to result in a final similarity score (or binary vectors as in instant claim 6) and for the many diagonals therein represented which are separately determined and scored as instant claim 4. Applicant has not presented any contrary evidence to the reasonable interpretation of a dot-matrix homology plot not reading on the broad interpretation of a pipelined adder tree, but only generally states that Lipman does not explicitly mention a pipeline operation. In the previous office action, the

examiner did not state the Lipman explicity mentioned a pipeline operation, but that the algorithm used by Lipman was reasonably interpreted as being a pipeline adder tree.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

No claim is allowed

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Sims, whose telephone number is (571)-272-7540.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Andrew Wang can be reached via telephone (571)-272-0811.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

// Jason Sims //

John S. Brusca 30 October 2006

JOHN S. BRUSCA, PH.D
PRIMARY EXAMINER